Electric Energy Generation To Charge a Smartphone With the Bicycle Wheel Movement

Ortiz Melendez, Alondra (School: Specialized School of Science and Mathematics Genaro Cautino Vazquez)

Hurricane María, a category 4 storm, made landfall in Puerto Rico on September 20, 2017. The hurricane left incapacitated the central electric power system, leaving the entire island without power as the island's grid was essentially destroyed (Campbell et. al, 2017). Also, the telecommunications were gravely affected due to the lack of electrical power to charge mobile phones and other electrical utilities. The need of electrical power influenced the search for alternate ways to produce energy. The purpose of this investigation was to develop a mechanism to generate electrical energy through mechanical energy, using a bicycle wheel movement(pedaling) to generate enough energy to charge a smartphone. A 12-voltage capacity dynamo was placed in the back wheel of the bicycle. Then a rectifier bridge, a capacitor, a voltage regulator, and a smaller capacitor was connected in sequence. The bike with the mechanism was ridden for 30-minutes. An app for tracking physical exercise was used to measure distance and velocity. After, the experiment was performed it was concluded that the smartphone can be charged with the mechanism, but it charged less in comparison to when it was charged in the receptacle. The manual transformer charged a 6% and the commercial transformer charged a 22%. There was a 16% of charge difference between both transformers. The proposed hypothesis was not rejected. The mechanism fulfilled the investigation purpose, generating enough energy to charge the smartphone.

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